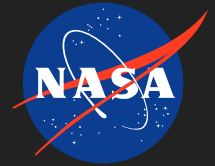


Online Sensing Techniques for Detection of Aircraft Electrical System Anomalies, Phase I

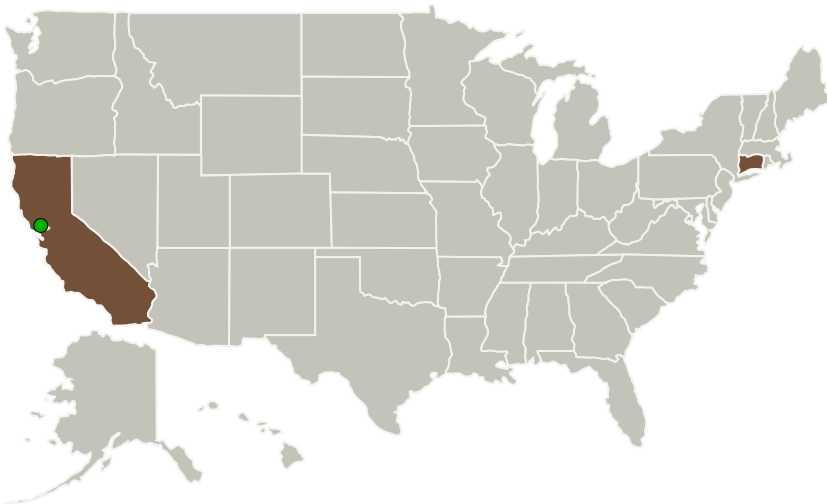
Completed Technology Project (2011 - 2011)



Project Introduction

As 'fly-by-wire' technologies become more prevalent in the aerospace systems, the need to develop innovative monitoring, diagnostic and fault tolerant techniques for the electrical systems is becoming obvious. Among all the possible electrical system failures, two types of failures are considered the most frequent, and hence most critical: intermittent disconnection in connectors, and capacitance failures. Despite the extreme care in the design and quality control in manufacturing and installation of these connectors in avionics and military equipment, there are increasing number of problems associated with the physical connectivity that ranges from intermittent discontinuities, sparks, and breakages. As for the capacitors, the power systems in modern aircrafts, specifically the ones with DC power supply configurations, rely very heavily on banks of capacitors that act as filters. These capacitors (especially of electrolytic type) present high failure rates - with no effective solution for online monitoring available. The proposed research will study detecting fault initiation, fault-to-failure progression, and online monitoring of the critical problems of intermittent disconnection, and capacitance aging and ultimate failures in aircraft power systems. We propose to develop a non-traditional use of wideband differential current sensor to detect capacitor degradation, as well as intermittent disconnection problems. This program is expected to generate useful, accurate and precise diagnostic information impacting the safety and maintenance of critical aircraft power systems.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Connecticut

Project Transitions

▶ **February 2011:** Project Start

✓ **September 2011:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138387>)

Project Management

Program Director:

Jason L Kessler

Program Manager:

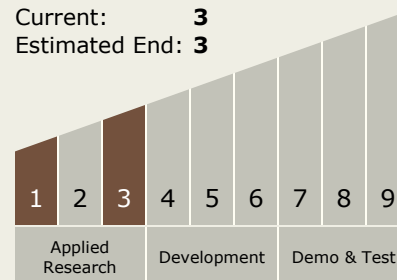
Carlos Torrez

Principal Investigator:

Antonio Ginart

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - TX03.3 Power Management and Distribution
 - TX03.3.1 Management and Control

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Target Destinations

The Sun, Earth, The Moon,
Mars, Others Inside the Solar
System, Outside the Solar
System